

Claims;

1. A film for a liquid crystal display comprising a fatty acid cellulose ester film having an acetyl group and a propionyl group, wherein sum of degree of acetyl substitution (DSac) and degree of propionyl substitution (DSpr) of the fatty acid cellulose ester of the fatty acid cellulose ester film is 2.8 or less, and a retardation value (Rt value) in the thickness direction defined by Formula 1 is 60 to 300 nm.

$$\text{Formula 1: Rt value} = \{(n_x + n_y)/2 - n_z\} \times d$$

wherein n_x represents refractive index of the fatty acid cellulose ester film in the direction giving maximum refractive index in the plane of the fatty acid cellulose ester film, n_y represents refractive index of the fatty acid cellulose ester film in the direction perpendicular to the direction giving maximum refractive index in the plane of the fatty acid cellulose ester film, n_z represents refractive index of the fatty acid cellulose ester film in the thickness direction, and d (nm) represent the thickness of the fatty acid cellulose ester film.

2. The film for a liquid crystal display of Claim 1, wherein retardation value (Ro value) of the fatty acid

cellulose ester film in the in-plane direction defined by Formula 2 of not more than 30 nm.

(Formula 2)

$$Ro = (n_x - n_y) \times d$$

3. The film for a liquid crystal display of Claim 1, wherein thickness of the fatty acid cellulose ester film is between 40 and 190 μm .

4. The film for a liquid crystal display of Claim 1, wherein the fatty acid cellulose ester film comprises fatty acid cellulose ester having DSac of 1.5 to 2.3, and DSpr of 0.5 to 1.2.

5. The film for a liquid crystal display of Claim 4, wherein the fatty acid cellulose ester of the fatty acid cellulose ester film comprises fatty acid cellulose ester having DSac of not less than 1.5 and less than 2.0.

6. The film for a liquid crystal display of Claim 5, wherein the fatty acid cellulose ester of the fatty acid cellulose ester film comprises fatty acid cellulose ester having DSpr of more than 0.9 and not more than 1.2.

7. The film for a liquid crystal display of Claim 1, wherein the fatty acid cellulose ester film comprises a plasticizer selected from a group consisting of a phosphoric acid ester compound, a fatty acid ester compound, a phthalic acid ester and citric acid ester compound, in an amount of 1 to 30 weight parts per 100 weight parts of the fatty acid cellulose ester film.

8. The film for a liquid crystal display of Claim 1, wherein the fatty acid cellulose ester film comprises fine particles having average particle size of not more than 0.1 μm in an amount of 0.005 to 0.3 weight parts per 100 weight parts of the fatty acid cellulose ester film.

9. The film for a liquid crystal display of Claim 1, wherein the fatty acid cellulose ester film comprises as UV absorber in an amount of 0.8 to 2.0 weight parts per 100 weight parts of the fatty acid cellulose ester film.

10. The film for a liquid crystal display of Claim 1, wherein the fatty acid cellulose ester film comprises foreign matter particles having a size of 5 to 50 μm in an amount of not more than 200 per 250 mm^2 and substantially no foreign

matter particle having a size of at least 50 nm observed in cross Nicol state.

11. The film for a liquid crystal display of Claim 1, wherein the film does not comprise a liquid crystal layer.

12. The film for a liquid crystal display of Claim 1, wherein the film comprises at least one of liquid crystal layer.

13. The film for a liquid crystal display of Claim 12, wherein the film comprises an alignment layer for the liquid crystal layer.

14. The film for a liquid crystal display of Claim 12, wherein Rt ratio of the liquid crystal layer to the fatty acid cellulose ester film, which is represented by the Formula 3, is 1.2 or less.

Formula 3 $Rt \text{ ratio} = (Rt'/Rt)$

wherein Rt' represents the retardation value in the thickness direction of the liquid crystal layer, represented by the following formula:

$$Rt' = [(n_x' + n_y')/2 - n_z'] \times d'$$

wherein n_x' represents refractive index of the liquid crystal layer in the direction giving maximum refractive index in the plane of the liquid crystal layer, and n_y' represents refractive index of the liquid crystal layer in the direction perpendicular to the direction giving maximum refractive index in the plane of the liquid crystal layer, while n_z' represents the refractive index in the thickness direction of the liquid crystal layer, and d' (in nm) represents the thickness of the liquid crystal layer, and R_t represents the retardation value in the thickness direction of the fatty acid cellulose ester film.

15. The film for a liquid crystal display of Claim 11, wherein the liquid crystal layer is composed of a rod shaped liquid crystal compound or a single molecular liquid crystal compound having positive refractive index.

16. The film for a liquid crystal display of Claim 11, wherein the liquid crystal layer is composed of liquid crystalline polymer compound.

17. A polarizing plate comprising a first protective film for the polarizing plate, a polarizing element, and a second protective film for the polarizing plate,

wherein at least one of the first protective film and the second protective film comprises a fatty acid cellulose ester film having an acetyl group and a propionyl group,

sum of degree of acetyl substitution (DSac) and degree of propionyl substitution (DSpr) of the fatty acid cellulose ester of the fatty acid cellulose ester film being 2.8 or less, a retardation value (Rt value) in the thickness direction defined by Formula 1 being 60 to 300 nm.

$$\text{Formula 1: Rt value} = \{(n_x + n_y)/2 - n_z\} \times d$$

wherein n_x represents refractive index of the fatty acid cellulose ester film in the direction giving maximum refractive index in the plane of the fatty acid cellulose ester film, n_y represents refractive index of the fatty acid cellulose ester film in the direction perpendicular to the direction giving maximum refractive index in the plane of the fatty acid cellulose ester film, n_z represents refractive index of the fatty acid cellulose ester film in the thickness direction, and d (nm) represent the thickness of the fatty acid cellulose ester film.

18. A liquid crystal display comprising first polarizing plate, a liquid crystal cell, and a second polarizing plate provided at inner portion with respect to the first polarizing plate and the liquid crystal cell, wherein

the first polarizing plate has a first polarizing element, a first protective film provided on a surface of the first polarizing element which surface is not faced to the liquid crystal cell, and a second protective film provided on a surface of the first polarizing element which surface is faced to the liquid crystal cell,

the second polarizing plate has a second polarizing element, a third protective film provided on a surface of the second polarizing element which surface is faced to the liquid crystal cell, and a fourth protective film provided on a surface of the second polarizing element which surface is not faced to the liquid crystal cell,

wherein at least one of the first protective film, the second protective film, the third protective film and the fourth protective film comprises a fatty acid cellulose ester film having an acetyl group and a propionyl group,

sum of degree of acetyl substitution (DSac) and degree of propionyl substitution (DSpr) of the fatty acid cellulose ester of the fatty acid cellulose ester film being 2.8 or

less, a retardation value (Rt value) in the thickness direction defined by Formula 1 being 60 to 300 nm.

$$\text{Formula 1: Rt value} = \{(n_x + n_y)/2 - n_z\} \times d$$

wherein n_x represents refractive index of the fatty acid cellulose ester film in the direction giving maximum refractive index in the plane of the fatty acid cellulose ester film, n_y represents refractive index of the fatty acid cellulose ester film in the direction perpendicular to the direction giving maximum refractive index in the plane of the fatty acid cellulose ester film, n_z represents the refractive index of the film in the thickness direction, and d (nm) represent the thickness of the fatty acid cellulose ester film.

19. The liquid crystal display of Claim 18, wherein at least one of the second protective film and the third protective film comprises a fatty acid cellulose ester film having an acetyl group and a propionyl group,

sum of degree of acetyl substitution (DSac) and degree of propionyl substitution (DSpr) of the fatty acid cellulose ester of the fatty acid cellulose ester film being 2.8 or less, a retardation value (Rt value) in the thickness direction defined by Formula 1 being 60 to 300 nm.

20. The liquid crystal display of Claim 18, which is vertical alignment liquid crystal display.

21. The liquid crystal display of Claim 18, which is twist nematic liquid crystal display.